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The Wattled Starling (Creatophora cinerea) (Menschen).

There has been little original contribution to the biology of this species for many years. Much that has been written would appear to have been obtained from the same few sources published about the turn of the century. Recent information that has been published is derived mainly from avicultural sources and has concerned the moult of the male bird. This moult, involving the change from feathered head to naked skins and wattles (gymnocephaly) is known in only two species of bird as a seasonal phenomenon.

There is still much to learn about the species. It is apparent from the literature that there is probably a difference in several details between the southern populations and those found north of the equator, and for this reason all information from the Eastern Cape has been given. The following is based mainly upon 24 hours of observation of a breeding colony of some four hundred nests on the farm Boschkraal, Kirkwood in the Sundays River Valley. Much information has also been obtained by private communication especially that collected by Mr. J. Sneyd Taylor from an enquiry made into the species in 1953.

General Behaviour

The Wattled Starling is not uncommon in the Eastern Cape, though it is predominantly seasonal in its occurrence. It is a social species that usually occurs in flocks. Small numbers, say from one to six individuals, most frequently associate with other flocking birds. The bigger groups may also associate with other species but the larger the flock of Wattled Starlings, the more likely that it does not mix with other species. The larger flocks are more often observed in July and August except in the presence of locusts. Locusts occur in summer and even in these days a swarm may be followed by a flock of over 1,000 Wattled Starlings. (S. H. Rubidge, Graaff-Reinet. December, 1953.)

In the Eastern Cape the Wattled Starling associates very frequently with the Pied Starling (*Spreo bicolor*) but much less often with the Cape Weaver (*Ploceus capensis*); these two species themselves often associate in mixed flocks, and Pym (1910) also records association with the Red-winged Starling (*Onychognathus morio*). In Central Africa association is recorded with Glossy Starlings (*Lamprocolius chalcurus* and *L. chloropterus*) and, curiously enough, Oxpeckers (*Buphagus* species). Wattled Starlings do not associate with the Glossy Starlings (*L. nitens* and *L. coruscus*) in the Eastern Cape. Both these Glossy Starlings are inhabitants of the moister evergreen coastal vegetation and where *L. nitens* occurs, in the drier parts, it is not usually a flocking species, at least not normally gathering in large numbers. In Central

Africa as well as in the Eastern Cape, the association of the Wattled Starling is with flocking species that frequent the dry open country.

The flocks rove about, gipsylike, so that one can never rely on finding the species in the same area for long.

The birds themselves spend most of their time feeding on the ground, strutting about much as the European Starling (*Sturnus vulgaris*) does. Less often do they feed in the trees, and when disturbed, they fly away in a manner similar to the European Starling, in a straight line, with rapidly beating pointed wings. A small flock may circle round to settle nearby on the ground or in a tree. A large flock when alarmed will fly off some distance, usually with a few accompanying squawks. The flock remains in close formation and this, combined with twisting and turning in unison and showing the white rump frequently, is very characteristic of the species. Generally speaking it is not a very wild bird, but is certainly not as confiding as the Pied Starling. This is known to frequent human habitation and Roberts (1933) records them feeding about slaughter houses.

The Wattled Starlings usually roost in large numbers which forgather in low trees or reedbeds. They gather before sunset and are restless before settling down for the night, but in the non-breeding period they settle without calling. At the approach of the breeding season their habits change in that they carry on aerial manoeuvres accompanied by a continuous chatter before settling down. This behaviour continues throughout the breeding period.

Distribution

The ecological distribution of this species has long been associated with locust breeding sites. In Southern Africa this has become more of a historical fact than a true reflection of the existing state of affairs, since the locust no longer breeds freely without control measures being taken. However, despite this, the birds are still able to keep up with the breeding locusts. Two observers (W. J. Quinton and S. H. Rubidge) reported from the Karroo in 1956, that large numbers (1,000 plus) of Wattled Starlings had been observed in the presence of hoppers whilst under normal conditions (without swarms of hoppers) the species was either considered rare or had not been noticed previously. A further report on a large nesting colony near Queenstown stated that the colony was bigger than 3-4 years previously and this seemed to coincide with the great increase in the grasshopper population that year. The species is not dependent upon the locust for breeding in the Eastern Cape since most recent observations indicate breeding colonies without mention of hoppers.

In the Eastern Cape the species is found throughout the drier regions. Such habitats as the dry xerophytic vegetation described by Acocks (1951) as Valley Bushveld or Thornveld are typical of its haunts. In the vicinity of Port Elizabeth the open, dry, valley systems of the Sundays, Swartkops and Coega Rivers form its favourite haunts. Here the habitat consists of scattered small-leaved acacia trees situated in open grass-covered ground.

The starlings may occur anywhere in the region, but it is exceptional to find them in the moister habitats such as the coastal bush or thicker forests.

The seasonal movements of the Wattled Starlings have also been associated with the locust movements. Though Roberts (1932) considers there may be some migratory movement in the species, the situation is aptly summed up by Gill (1936), "roving, appearing almost anywhere for a time in flocks, then disappearing".

Where the species breeds, it is common in the summer months, though good rains in a particular district will tend to attract the summer birds there. Anderson (Gurney 1872) states that the birds are migrants "arriving in the rains, departing on return of the dry". Where it has not been recorded breeding the species is often only found as a winter visitor. Winterbottom (1959) refers to the species as a winter and spring visitor (to Northern Rhodesia) from some place west or south-west. It is probable that immature birds from late breeding elsewhere will contribute to the confusion when they wander.

It is worth noting in relation to the seasonal movements that the hoppers usually hatch after rains during the summer and it is probable that this fact is "known" by the Wattled Starlings which always seem to turn up at the right place at the right moment. Lea (1958) reports that locust increases most often follow a season in which the early summer rainfall was low. In connection with this, three correspondents relate that these birds do not breed every year in an area but only after good seasons. This would imply that the previous year was a dry year and thus, according to Lea's findings, the hoppers would be more plentiful than normal. W. F. Quinton writes that the birds occur in the Beaufort West area usually after rains and that in 1956 after abundant rains the birds, previously considered rather rare and unknown to have bred, suddenly appeared and established a large breeding colony. From this information it would appear that the occurrence of rain itself attracts the birds. This, however, is not the whole picture since the colony at which the following observations were made, was established during one of the severest droughts in the Eastern Cape for many years; this site had previously been occupied during unusual flooding. Nesting under unfavourable conditions is recorded but is generally the exception to the rule.

In the Eastern Cape the picture is more complete. Over the dry inland areas where the species may breed it is primarily a summer resident that wanders to those districts where good rains have occurred; in these areas vagrant flocks may occur throughout the winter too. There is a wide winter dispersal which extends to moister regions where it does not breed, and the coastal areas where it is almost entirely a winter visitor. The movement is thus a dispersal rather than a formal migration.

Food

It was stated by Reichenow at the turn of the century that this species is absolutely dependent upon locusts. Whatever the state of affairs was then, this is certainly not the case these days, though the birds may turn up in new localities on the appearance of locusts. Evidence is also given by Vesey-Fitzgerald (1955) that it is not only in the Eastern Cape that the species is no longer dependent upon locusts, but also in Rukwa valley in S.W. Tanganyika where the Wattled Starling has not been seen to attack locusts in any stage.

The most abundant recorded food is locusts in various stages, even including burnt locusts consumed after a grass fire. Insects form the bulk of the food with records such as "chiefly small coleoptera"; "beetles and sand"; "grasshoppers and many beetles". The breeding colony at Kirkwood fed largely on a brown grub (not identified) and during irrigation of farmlands brought in brown and green grasshoppers, dipterous-like larvae, a transparent-winged insect and a worm. Worms are recorded several times.

There are also several references to fruit, especially from material from S.W.A. Hoesch (1940) also mentions fruit and Chapin (1954) identifies the berry of *Ziziphus mucronatus*. Berries, probably from *Azima tetracantha*, were also found in a bird in very fat condition.

Voice

Compared to other members of the *Sturnidae* in non-breeding periods this is a silent species. In a large flock it will be one or two individuals alone that call the alarm squawk.

The normal song is described by Joubert (1945) as similar to that of the Rosy Pastor, complete with imitations of other birds, save that it is harsher and more squeaky. It is a rambling raucous song interspersed with pleasantly whistled notes. Parts such as an oft-repeated "squeezily-squeeze-squeeze" are recordable but most is beyond description.

The alarm in flight is a double "squeeky-squawk", but there is also another flight call which small groups utter, a less harsh triple-syllabled phrase. At the nesting site there is another alarm note, a single nasal "graaaaah", rather quiet and deep, that cannot be heard from very far off.

During nesting, the close packed colony is a babble of noise with birds calling and singing all about the nesting trees. The noise can be heard before the nests themselves can be seen and this serves to aid one find their nesting colony. Their combined noise is considerable and vies with that of any other member of the starling family under these circumstances. The clatter of calling young waiting for food is as loud and must be heard to be believed.

The females utter a high-pitched twittering when soliciting the males. They also call when coming to the nest; this is the flight call uttered some yards before reaching the nest.

When singing the bird assumes an unusual stance. The feathers are slightly fluffed; the head and neck are drawn in a little and lowered so that the impression given is of a hunched up attitude. When singing the head is moved up and down in a sort of pumping motion from a higher horizontal position to a lower upward-sloping position. Whilst thus 'pumping' the peculiar song is uttered.

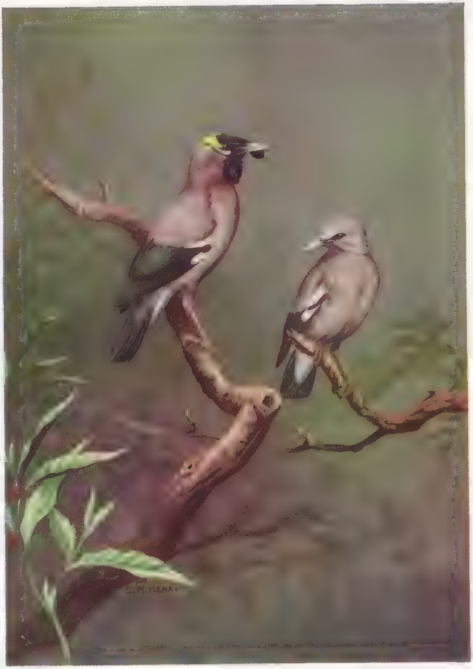
Plumage

The unique seasonal change of appearance of the male bird is well illustrated in the accompanying plate. The picture depicts the same bird in breeding and non-breeding condition, and was taken from birds kept in the London Zoo. With the same experience in the aviaries at the Port Elizabeth Museum there is no doubt that such a change is normal. It may be noted, however, that it was not very long ago that this matter was still open to criticism because some aviary birds had not produced the wattled condition after several years.

Observations in the Eastern Cape show that birds in the wild usually show no, or very little, naked skin or wattles except for a period from September (rarely late August) to January or sometimes later to March when breeding is late. According to Chapin the same breeding condition is recorded from April through to November-December in the Congo. Both these periods coincide with the known breeding times in the respective regions. Even during the period when wattles may be noted, very few in a flock show much indication of wattling. In one observation only three out of ten birds showed any distinctive change. Chapin (1954) doubts that there were more than two bald males in a breeding flock of forty or more birds. This agrees with local observations where one male in about twenty nests showed the full wattled condition. The wattles and naked skin are lost as breeding progresses; in the colony under observation there was only one 'bald' male left when the young were already clambering about the trees.

The presence of wattle and naked skin on the female has been overlooked by most workers. Roberts (1940) mentioned it, basing his information on an original observation by Dr. H. Exton recorded on an interleaved copy of Layard's "Birds of South Africa" (1867) (see Roberts 1935). Exton wrote that he had shot eight females "one combed and wattled, I thought to be a male, but on dissecting it it proved to be a female; plumage that of the female but having the comb and wattles of the male, the ovary fully developed, a physiological curiosity".

It has been shown by Crandell (1949) that males with large wattles and much naked skin are older birds. Young birds kept in captivity for one year merely show black malar regions with a small area of black on the lores; these are presumed first year male birds. Presumably it is only old females that show wattles or bald regions. Thus in male and female birds there is a complete gradation according to age, with the probability that the males show the 'breeding condition' at an earlier age than the female. This explains the statement (see Friedmann 1937) that the state of the wattles in no way indicates the condition of the reproductive organs, for in actual fact breeding birds may not necessarily have wattles. All observers at the Boschkraal colony were utterly confused when attempting to determine sexual differences between nesting pairs.


G. M. HENRY

It is stated in nearly all general works that the female has the primary coverts black and the male has these feathers white. This is not correct in Southern Africa where an inspection of male skins shows considerable variation. The male primary coverts may be pure white, grey or with outer webs only, white; this pattern may or may not extend onto the neighbouring few secondaries. There would appear to be no connection between the presence, absence, or extent of white and the presence or absence of wattling; though no advanced wattling occurs with grey coloured coverts. No skins of females examined showed wattling. The impression gained in the field was that some females were wattled, the older lighter females more so than others. Also it was believed that some advanced females had white primary coverts. It should be stressed that sexing was based upon individual behaviour of the pairs at their nest and, whilst the species appears to be monogamous, the possibility of incorrect sexing is not overlooked. However, with three independent observers, the same conclusions were arrived at; namely that only a few old males in the colony had advanced baldness and wattled heads; that some of both sexes had naked skin around the eye and forehead with a small "dewlap" and small front "carbuncle"; that of these latter there was apparently no consistency in colour of primary coverts except perhaps that older birds (male or female) had white primary coverts; that some breeding males and females had only the yellow skin about the eye and the black on the malar and chin. This last condition is similar to birds one year old.

Young birds are distinguished for the first few weeks after leaving the nest by their noticeably shorter tails. Once the tail has reached normal length it is not possible to distinguish them in an aviary from non-breeding adults.

There is considerable individual variation in the wattles. There are two lobes on the chin which hang down side by side and there are two lobes on the forehead, one in front of the other. The pair above, or either one above, may be very much larger than the rest. In one aviary kept bird the lower lobes were dominant for the two successive 'breeding' periods it has been in captivity.

Geographical Variation in Plumage

Though no races have been named there is a cline in body colour from a buffy white in the south through to a smoky grey in the north. Birds from the Cape Province and Orange Free State are lighter, except for one specimen from Zoetendalsvlei, C.P., whilst birds from Swaziland, Bechuanaland and the Rhodesias tend to be darker. There is comment from one correspondent in Natal having seen and collected very much whiter birds than normal. The series of thirty specimens from the Transvaal Museum were inadequate to come to any conclusions on this matter. Field impressions at the breeding colony were that older birds were lighter coloured, though the range of variation was never as much as that shown by the skin series.

General Notes on Breeding

It is the unusual breeding behaviour of this species that has attracted much attention and in particular the mass breeding that is so wonderfully timed to coincide with the mass hatching of locusts. Webb (1951), quoting the notes of R. Hook, was the first to draw attention to the fact that there are two distinct modes of breeding. In the ordinary way the birds breed in small colonies of anything up to four hundred nests. The more unusual way is far more erratic and unpredictable and is dependent upon the breeding of locusts, on these occasions nests number "thousands and thousands" and extend for hundreds of yards.

The colony breeding at Boschkraal returned to the identical trees that had been used some years previously. Maj. E. Wolley had recorded that the site was used before 1953 (private communication). Thus there had been an interval of at least six years between the two nesting periods 1953 and 1959. It is remarkable that the very same trees should be used again; presumably at least some birds must be more than six years old. In many passerines, individuals return to the same area, if not territory, that is used for breeding year after year, but this is evidently not the case with the Wattled Starling. In the last few years in the Eastern Cape breeding colonies have been reported every year (see Appendix 1), but sometimes these are hundreds of miles from the nearest known spot of the previous year. It is not presumed that all nesting sites are known, but several are and these are in areas more or less under regular observation by farmers, so that if the birds bred regularly in one site it would be known. It is inconceivable that the picture presented of breeding in the same site after long periods could maintain the numbers of the starlings sufficiently high for survival of the species. If the same individuals do breed every year it would seem that they breed at some distance from their previous site.

Hitherto, Cock nests or False nests have not been recorded in the literature but observations by J. M. Spence are highly suggestive of this phenomenon. At one feeding area where the birds had returned on several consecutive occasions, about a dozen cockbirds started building nests in the thorn trees. These nests were never completed nor domed, for the cocks would start another nest without finishing the first and thus little clumps of nests were constructed and defended by the cock birds. Females alighted on the bushes but took no activity in nest building. Observations by Plowes and Cusack (1944) may possibly be of this phenomenon. Spence records the nests were built for several weeks.

The true nesting colonies are reported to be established very quickly. Two records indicate that one week there was no sign of nesting and yet a week later nesting was well established. At Boschkraal the nesting area was unoccupied on a Sunday, the following Wednesday nesting was recorded and by Friday both sexes were observed carrying nesting material to the nest. Not only is nesting quickly established, but the entire cycle is rapid. On 28th September no evidence of breeding was seen. On 2nd October the first nesting was seen and by 2nd November only one nest still contained young, a remarkable cycle in which over 400 nests were built, in more than half of which young were reared, all within a period of five weeks. Such a rapid and closely timed cycle also occurs in the Red-billed Quelea (*Quelea quelea*), but this is a very much smaller species. The simultaneous timing of such a large colony of Wattled Starlings is quite extraordinary.

Mention is made above that more than half the nests built are used for rearing young. A second Wattled Starling breeding colony ten miles from Boschkraal with two to three hundred nests was reduced to about fifty nests for rearing chicks. The first point of interest is the building of the extra nests. Many nests are built by birds showing no baldness or pronounced wattling, and it is suggested here that these are birds of the year; the only birds observed taking nesting material from other nests were birds of this group. It is relevant to mention here that in the evenings large numbers of birds would leave the colony and roost some miles away in reed beds. It is possible that these were the same yearling group without eggs or young.

Concerning the reduction in the number of nests, it should be mentioned that nests were actually destroyed by the starlings themselves. This was first observed with the 'yearling' birds taking nesting material from unbuilt nests for their own nests, and later it was found that all the nests on one tree were taken to bits and removed. As these nests were the nearest to the point of observation, the impression was gained that the presence of the observer disturbed the birds, but this was not the explanation for one nest. Eggs were noted in the nest on the 11th November and these had hatched by the 14th. This was a single nest and when the site was inspected on the 20th there were absolutely no signs of even twigs on the ground beneath the tree where the nest had been situated the whole thing, young and all, had disappeared!

Nesting

In all records for the Eastern Cape the nest sites are situated in thorn trees, which would seem to be normal in Southern Africa, the site varying only in height from the ground, the lowest recorded being just over five feet and the highest was about 20 feet. All were situated in the thorny *Acacia karroo* trees inside the outer foliage amongst the thicker branches.

The nest usually starts with both sexes building a basal structure of twigs. The sides are then built up and finally the dome is completed. Feathers are brought for lining before the dome is commenced and at this stage the eggs are laid. No doubt Sharpe (1884) in reporting that the species built cup-shaped nests had found the colony at this stage of the proceedings. The structure appears rough and untidy from the outside but inside the chamber there are no ends or pieces sticking out. The entrance is usually from the side or from above, sloping slightly downwards in single nests, but in multiple nests the entrances are frequently steeper, some even becoming vertical. One such nest had a vertical tunnel of at least nine inches before the nest chamber. A few nests may be solitary, but the majority were of two or three nests combined in one mass of twigs, and as many as eight in one mass were noted.

The main nesting material observed was sticks from the thorn trees, but stalks from a composite, which in many cases still retained the seedheads, were also used. Within the cavity were a few heads of grass and other plant leaves and seeds, and there were a few feathers lining the bowl, guineafowl feathers being used in one instance. Despite the dirty nesting habits, few nest parasites were found. A few Tropical Fowl Mites, *Macronyssus bursa* (Berlese) were found, also living Psocids and one Dermestid larva.

Building of the nest is shared by both partners. Usually the material used was freshly gathered within sight of the nest. A bird would fly downwards from the nest to land on a low branch, where it would then strut up and down peering at various twigs before deciding upon a particular one. This would be grasped in the bill and then broken off; if it did not come easily it was left and another selected. The bird would then fly back to the nest, uttering a flight call before reaching the nesting tree. Very often the mate remained near the nest preening or resting until the other bird arrived with nesting material and then it too would fly off to gather another twig. In the communal nests it was usual to find one or another of the pair at the nest during the building period. It appears probable that at this stage the eggs were either being laid or had already been laid, which would explain the constant guard by the birds.

Eggs

The eggs are laid before the nest is complete. This assumption is based upon the fact that building was observed to be actively carried on up to about three days before egg shells from hatched eggs were found on the ground. It is also confirmed by Sharpe's (1884) reference mentioned above.

The eggs are white with a pale bluish tinge. "Heaven-blue" to white have been recorded, but all the eggs observed were similar in colour at this colony. Egg shells, which were littered on the ground under the nests after hatching, rapidly lost their delicate blue after the first day or two.

Only four clutches were noted, three of these being of four eggs and one of three. Both sexes incubate. During one period of observation with the temperature abnormally high (88° F. in the shade) no birds were seen to be actually sitting on the eggs.

Nestlings

Hatching occurred almost simultaneously throughout the colony. First egg shells were observed on the 11th (two only) and by the 14th innumerable shells were strewn about the ground. The young are naked and flesh-pink in colour.

Development is rapid and by the 27th the first young were already scrambling over the nests (13-16 day interval). In one nest there were newly hatched young and hatching eggs on the 14th and on 29th one of the young climbed out of the nest when it was approached for inspection. Another nest with newly hatched young on the 14th had the young scrambling on top of the nest on the 29th (15 days old).

When the young are still unable to fly they crawl about the nesting tree and most are found sitting on the tops of the trees calling incessantly for food. Six days after the first young were seen scrambling out of the nest, the number of young in the colony was estimated to have halved, so that the young must leave the nesting colony almost as soon as they can fly. They remain, in the Sundays River Valley, however, for as long at least, as they can be distinguished as young.

Parental Behaviour

From the observations made, it is believed the species is monogamous. Only two birds were ever observed in attendance at one nest and both sexes take active part in nest building, incubation and feeding of young. The degree of activity of either the male or female in relation to the activity of its mate varied considerably; thus in some the males were more active, whilst in others the females were more active.

During nest building the pairs remained in fairly close proximity to each other in the initial stages, even away from the nest, but when the eggs had been laid, one bird always remained at the nest. In a one-and-a-half hour period of observation on one nest, it was unattended for only five minutes; the male was absent for only three intervals (the longest of 10 minutes) and brought twigs twice; the female was absent most of the time and brought twigs on only two of her three visits.

During incubation both parents bring new nesting material to the nest. After young hatch, the males still bring fresh nesting twigs fairly frequently, whilst only one female was seen to do so at this stage of the breeding.

The mode of collecting food for the young varies as the young aged. At first birds collect near the nests carrying out their characteristic straight downward flight from the nest that was evident during nest building. Having settled on the ground they then strut about seeking food, usually covering many yards before having sufficient and flying back to the nest. As the young become larger (and presumably the local food source dried up), the adults fly further afield. They usually depart in small groups, in this case calling and flying across to the orchards especially when irrigation was taking place. Food observed as being carried included grubs, earthworm-like creatures, a moth, antlion, grasshopper and caterpillars.

In the earlier literature there is mention of how the adults leave their young when the food supply fails and the young starve to death. The best description is that given by Mrs. Barber (Cradock), who was evidently a competent observer and there is one recent record by Mr. J. Sneyd Taylor of a similar occurrence. However, there is no doubt some exaggeration and this is more than likely due to the fact that a number of young die in the colony, their remains being quite evident. The whole nesting cycle is so abnormally short that observers return expecting to find young when in actual fact they have already left and all that remains are the evidence of a mortality which is not unreasonable for such a colonial nesting species.

Aggression was observed only once in the nesting colony. One male in possession chased off another bird that landed on a group nest to which it did not belong.

Soliciting was frequently seen. The stance assumed is similar to that of the singing bird. The head is pumped up and down more rapidly and the wings (lowered) are quivered. The tail is inclined upward thus showing the white rump more prominently against the dark tail. The male faced the female, thus standing parallel to the branch, or more frequently, the male would sit alongside the female and sidle up towards her in an excited quiver and chattering of song. Copulation followed from this pose, usually with active soliciting by the female. After copulation the female would continue to solicit, sometime with the desired effect, but on most occasions the male settled on a branch a short distance away and preened in an exaggerated manner.

On one occasion copulation was observed about five miles away from the nesting colony.

The birds acted in unison when alarmed. On one occasion a raptor flew overhead. The effect was sudden panic with all birds rising into the air and merging into a dense flock which streamed off to the outside of the colony to settle on the topmost branches of a tree, all chattering and craning their necks as though to see what all the alarm was about. As suddenly, silence fell on the group and they all departed as small groups back to their nests.

Summary

The results of observations at a breeding colony of Wattled Starlings are given with discussion comparing previously published information. Comparison is made between the birds of the Eastern Cape Province and elsewhere.

The species is not a regular migrant, but wanders widely. Ecological factors such as association with breeding locusts and feeding habits are given. The wattled condition of both sexes is discussed; sexual dimorphism probably disappears with age. There is a clinal colour variation in the geographical distribution.

Both sexes take part in all breeding activities. False nests and nest destruction is mentioned. The remarkable timing in the breeding results in the colony having a limited existence of only five weeks. Fledgling period is 15 to 16 days.

Acknowledgments

Thanks are gratefully extended to Maj. E. Woolley, on whose farm the colony nested, also for his keen interest, observations, and for keeping the author informed of events.

Mr. J. Sneyd Taylor has very kindly made all his notes available; these include many letters, the results of an inquiry into this species made in 1953. He also collected details on the nest and nest parasites, as well as making field observations. Miss A. Pomeroy also assisted with field observations. Mrs. Schutte kindly gave information on a second breeding colony which nested on her farm at Kirkwood.

Personal communications to J. Sneyd Taylor, C. J. Skead and the writer have been quoted from Messrs. W. F. Quinton, S. H. Rubidge, E. McNaughton, A. P. Bremner, G. Maasdorp, V. Pringle, F. S. Pocock, A. Lea, R. W. Weir, Mrs. C. Niven and Miss M. Paterson. Records of the R.O.S. nest cards have been used.

APPENDIX 1

Records of nesting in the Eastern Cape reported to J. S. T.

Beaufort West	March 1956; Bred after abundant rains, best since 1921. Previous nesting not known. Wattles recorded January to March. (Quinton.)
Oudtshoorn	Breed irregularly.
Graaff-Reinet	(*a*) 13th January about 60 nests at a site they have been known to use before. (*b*) Also on McNaughton's farm where they do not breed every year—only in good seasons. (*c*) Nest along both sides of road for about 500 yards; new in the area. (Rubidge.)
Bedford	Bred near here three times in last 10 years, also bred at Spring Valley. (Pringle.)
Queenstown	A very large colony 1951. Seemed to coincide with great increase in grasshopper population. Occurred three to four years ago. (Weir.)

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